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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/654,173	09/03/2003	Manfred Apel	P03,0330	4321
26574	7590	08/24/2004	EXAMINER	
SCHIFF HARDIN, LLP PATENT DEPARTMENT 6600 SEARS TOWER CHICAGO, IL 60606-6473			YUN, JURIE	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	OK
	10/654,173	APEL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jurie Yun	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 20 January 2004.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-9 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-6,8 and 9 is/are rejected.  
 7) Claim(s) 7 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1.) Certified copies of the priority documents have been received.  
 2.) Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____ .  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/20/04</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____ .                                  |

## DETAILED ACTION

### ***Claim Objections***

1. Claim 1 is objected to because of the following informalities: there appears to be a typo in line 3 in that "ring electrode" should be "ring anode" in order to keep the terms consistent throughout the claim. Appropriate correction is required.
2. Claim 8 is objected to because of the following informalities: there appears to be a typo in line 3 in that "ring electrode" should be "ring anode" in order to keep the terms consistent throughout the claim. Appropriate correction is required.
3. Claim 9 is objected to because of the following informalities: there appears to be a typo in line 3 in that "ring electrode" should be "ring anode" in order to keep the terms consistent throughout the claim. Appropriate correction is required.
4. Claim 9 is objected to because of the following informalities: there appears to be a typo in line 17 in that "radiation detector matrix" should be "radiation detector" else there is lack of antecedent basis. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
6. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It

is unclear what the purpose and cooperative interaction is between the "isolator" and "piston part".

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (USPN 4,926,452) in view of Burke et al. (USPN 5,305,363).

9. With respect to claim 1, Baker et al. disclose an x-ray tube (Fig. 4) comprising: a stationary vacuum housing (380) having a central axis; an electron-emitting cathode (310) and a ring anode (287) having an impact surface disposed in said vacuum housing; a deflection system (281) disposed in said vacuum housing for interacting with electrons (285) emitted by said cathode to focus and deflect said electrons to form an electron beam which is incident on said impact surface to generate x-rays (282); a round exit window (370) for said x-rays disposed in a plane perpendicular to the central axis and terminating one side of said vacuum housing; said impact surface of said ring anode being beveled and aligned to said exit window. Baker et al. disclose all the elements except for an annular anode cooling arrangement surrounding said ring anode at an exterior of said vacuum housing. Burke et al. disclose an annular anode cooling arrangement (12) surrounding said ring anode (B) at an exterior of said vacuum housing. It would have been obvious to one of ordinary skill in the art at the time the invention

was made to use an annular anode cooling arrangement surrounding the ring anode at an exterior of the vacuum housing, as taught by Burke et al., in the Baker et al. apparatus, to keep the target from overheating and melting.

10. With respect to claim 2, Baker et al. do not disclose a diaphragm disposed at the exit window at the vacuum housing defining a circular opening for passage of x-rays therethrough. Burke et al. disclose a diaphragm (Fig. 2, 132) disposed at the exit window at the vacuum housing defining a circular opening for passage of x-rays therethrough. It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the Baker et al. apparatus to include a diaphragm disposed at the exit window at the vacuum housing defining a circular opening for passage of x-rays therethrough, as taught by Burke et al., to precisely define the beam in order to limit hazardous and deleterious scattered radiation that would otherwise result.

11. With respect to claims 5 and 6, Baker et al. disclose the impact surface (Fig. 5, 354) of the ring anode (287) has a cross-section primarily formed as a circular arc, wherein the impact surface has a center point disposed outside of the ring anode.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (USPN 4,926,452) in view of Burke et al. (USPN 5,305,363) as applied to claim 1 above, and further in view of Schardt et al. (USPN 6,339,635 B1).

13. With respect to claim 4, Baker et al. do not disclose the deflection system is a quadruple magnet system. Schardt et al. disclose a quadruple magnet system (abstract). It would have been obvious to one of ordinary skill in the art at the time the

invention was made to further modify the Baker et al./Burke et al. apparatus to include a quadruple magnet system instead of the focus coils and steering coils used by Baker et al., because it would be more efficient to use one device for both focusing and steering.

14. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (USPN 4,926,452) in view of Burke et al. (USPN 5,305,363), and further in view of Pfeiler (USPN 4,352,986).

15. With respect to claim 8, Baker et al. disclose an x-ray system comprising: an x-ray tube (Fig. 4) comprising a stationary vacuum housing (380) having a central axis; an electron-emitting cathode (310) and a ring anode (287) having an impact surface disposed in said vacuum housing; a deflection system (281) disposed in said vacuum housing for interacting with electrons (285) emitted by said cathode to focus and deflect said electrons to form an electron beam which is incident on said impact surface to generate x-rays (282); a round exit window (370) for said x-rays disposed in a plane perpendicular to the central axis and terminating one side of said vacuum housing; said impact surface of said ring anode being beveled and aligned to said exit window.

Baker et al. do not disclose an annular anode cooling arrangement surrounding said ring anode at an exterior of said vacuum housing. Burke et al. disclose an annular anode cooling arrangement (12) surrounding said ring anode (B) at an exterior of said vacuum housing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an annular anode cooling arrangement surrounding the ring anode at an exterior of the vacuum housing, as taught by Burke et al., in the Baker et al. apparatus, to keep the target from overheating and melting.

Baker et al. do not disclose a radiation detector matrix, said x-ray tube being oriented relative to said radiation detector matrix so that said x-rays exiting through said exit window are incident on said radiation detector matrix, and a slit diaphragm disposed in a path of the x-rays between the x-ray tube and the radiation detector matrix. Pfeiler discloses a radiation detector matrix (5), the x-ray tube (4) being oriented relative to the radiation detector matrix so that the x-rays exiting through the exit window are incident on the radiation detector matrix, and a slit diaphragm (10 & 11) disposed in a path of the x-rays between the x-ray tube and the radiation detector matrix. It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the Baker et al./Burke et al. apparatus to include a radiation detector matrix, the x-ray tube being oriented relative to the radiation detector matrix so that said x-rays exiting through said exit window are incident on said radiation detector matrix, and a slit diaphragm disposed in a path of the x-rays between the x-ray tube and the radiation detector matrix, to define and limit the x-ray beam which enhances the production of tomographic images.

16. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (USPN 4,926,452) in view of Burke et al. (USPN 5,305,363), and further in view of Gabbay et al. (USPN 4,250,425).

17. With respect to claim 9, Baker et al. disclose an x-ray system comprising: an x-ray tube (Fig. 4) comprising a stationary vacuum housing (380) having a central axis; an electron-emitting cathode (310) and a ring anode (287) having an impact surface disposed in said vacuum housing; a deflection system (281) disposed in said vacuum

housing for interacting with electrons (285) emitted by said cathode to focus and deflect said electrons to form an electron beam which is incident on said impact surface to generate x-rays (282); a round exit window (370) for said x-rays disposed in a plane perpendicular to the central axis and terminating one side of said vacuum housing; said impact surface of said ring anode being beveled and aligned to said exit window. Baker et al. also disclose a radiation detector (250), said x-ray tube being oriented relative to said radiation detector so that x-rays exiting through said exit window are incident on said radiation detector.

Baker et al. do not disclose an annular anode cooling arrangement surrounding said ring anode at an exterior of said vacuum housing. Burke et al. disclose an annular anode cooling arrangement (12) surrounding said ring anode (B) at an exterior of said vacuum housing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an annular anode cooling arrangement surrounding the ring anode at an exterior of the vacuum housing, as taught by Burke et al., in the Baker et al. apparatus, to keep the target from overheating and melting.

Baker et al. do not disclose a depth diaphragm disposed in a path of said x-rays between the x-ray tube and the radiation detector, the depth diaphragm having a plurality of slits, and wherein the deflection system in the x-ray tube deflects the electron beam relative to the impact surface to produce a plurality of beam fans, the depth diaphragm having a plurality of slits through which said beam fans respectively pass, and strike respective detector lines of the radiation detector. Gabbay et al. disclose a depth diaphragm (10) disposed in a path of said x-rays between the x-ray tube and the

radiation detector, the depth diaphragm having a plurality of slits, and wherein the deflection system in the x-ray tube deflects the electron beam relative to the impact surface to produce a plurality of beam fans, the depth diaphragm having a plurality of slits through which said beam fans respectively pass, and strike respective detector lines of the radiation detector. It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the Baker et al./Burke et al. apparatus to include a depth diaphragm disposed in a path of said x-rays between the x-ray tube and the radiation detector, the depth diaphragm having a plurality of slits, and wherein the deflection system in the x-ray tube deflects the electron beam relative to the impact surface to produce a plurality of beam fans, the depth diaphragm having a plurality of slits through which said beam fans respectively pass, and strike respective detector lines of the radiation detector, to produce very fast tomographic images.

***Allowable Subject Matter***

18. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
19. The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to disclose an x-ray tube wherein the ring anode has a primarily triangular cross-section with a long side and a short side, said short side being directed toward said exit window and said impact surface being disposed on said short side.

***Conclusion***

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jurie Yun whose telephone number is 571 272-2497. The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

J.Y. Jurie Yun  
August 17, 2004

*Craig E Church*

**Craig E. Church**  
**Primary Examiner**